

Application/Control Number: 10/081,968

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CImpto

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1. A light-guide plate which is planar-shaped,  
comprising:

an edge portion which is convexly shaped; and  
a corner portion is convexly shaped.

2. A area light source apparatus, comprising:

a light-guide plate which is planar-shaped, having an  
edge portion and a corner portion that are convexly shaped;

at least one light source which is arranged on a  
peripheral side-surface of said light-guide plate;

a case frame which is arranged on a rear surface side  
and a side-surface side of said light-guide plate; and

a light scattering sheet which is arranged on an upper  
surface of said light-guide plate.

3. A area light source apparatus according to Claim 2,  
wherein a reflecting plate having a high reflectance is  
arranged between said light-guide plate and said case frame.

4. A area light source apparatus, comprising:

a light-guide plate which is planar-shaped;

at least one light source which is arranged on a  
peripheral side-surface of said light-guide plate;

a reflecting plate having a high reflectance, which is  
arranged on a rear-surface side of said light-guide plate

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and on a side-surface side other than a mounted surface of the light source;

a bottom plate which is arranged on a rear-surface side of said reflecting plate;

a case frame which is arranged on the side-surface side of said light-guide plate via said reflecting plate;

and

a light scattering sheet which is arranged on an upper surface of said light-guide plate.

5. A area light source apparatus according to Claim 4, wherein said reflecting plate is arranged on said mounted surface of the light source, excluding a portion of the light source.

6. A area light source apparatus, comprising:

a light-guide plate which is planar-shaped;

at least one light source which is arranged on a peripheral side-surface of said light-guide plate;

a reflecting plate having a high reflectance, which is arranged on a rear-surface side of said light-guide plate;

a bottom plate which is arranged on a rear-surface side of said reflecting plate;

a case frame which is arranged on the side-surface side of said light-guide plate; and

a light scattering sheet which is arranged on an upper surface of said light-guide plate.

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7. (Amended) A area light source according to any one of claims 3, 5, or 6, wherein said reflecting plate has a reflectance of 90% or more.

8. (Amended) A area light source apparatus according to any one of claims 3, 5, or 6, wherein said reflecting plate is made of a mirror, an aluminum thin film, or a high-reflectance film.

9. (Amended) A area light source apparatus according to any of claims 1, 2, or 6, wherein said rear surface of said light-guide plate is formed to scatter light.

10. A area light source apparatus comprising: a light-guide plate which is planar-shaped; at least one light source which is arranged on a peripheral side-surface of said light-guide plate; a case frame formed integrally with a bottom cover, for accommodating said light-guide plate and said light source; and a light scattering sheet which is arranged on an upper surface of said light-guide plate, wherein said light source is arranged on the peripheral side-surface of said light-guide plate by fitting at least one pin formed on the side surface of said light-guide plate, into a hole formed on said light source corresponding to said pin.

11. A area light source apparatus comprising: a

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light-guide plate which is planar-shaped; at least one light source which is arranged on a peripheral side-surface of said light-guide plate; a case frame formed integrally with a bottom cover, for accommodating said light-guide plate and said light source; and a light scattering sheet which is arranged on an upper surface of said light-guide plate, wherein said light-guide plate is fitted into said case frame and is fixed to said case frame by a hook, as a projected latching portion, having an engaged surface on a lower end, which is provided for said case frame or said light-guide plate.

12. A area light source apparatus comprising: a light-guide plate which is planar-shaped; at least one light source which is arranged on a peripheral side-surface of said light-guide plate; a case frame formed integrally with a bottom cover, for accommodating said light-guide plate and said light source; and a light scattering sheet which is arranged on an upper surface of said light-guide plate, wherein said light scattering sheet is adhered to a lower surface of a reinforcing frame,

said case frame has a notch corresponding to a portion for accommodating said reinforcing frame at a part of an upper end surface, and

said reinforcing frame is accommodated in said case frame by fitting a projected latching portion provided at an end surface of said reinforcing frame, into a concave

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portion provided on an inner surface of the notch of said case frame.

13. A area light source apparatus comprising: a light-guide plate which is planar-shaped; at least one light source which is arranged on a peripheral side-surface of said light-guide plate; a case frame formed integrally with a bottom cover, for accommodating said light-guide plate and said light source; and a light scattering sheet which is arranged on an upper surface of said light-guide plate, wherein said case frame has a notch corresponding to a portion for accommodating said light scattering sheet at a part of an upper end surface, and said light scattering sheet is accommodated in said case frame by fitting a projected latching portion provided on an end surface of said light scattering sheet, into a concave portion provided on an inner surface of the notch of said case frame.

14. A area light source apparatus comprising: a light-guide plate which is planar-shaped; at least one light source which is arranged on a peripheral side-surface of said light-guide plate; a case frame for accommodating said light-guide plate and said light source; a bottom cover; and a light scattering sheet arranged at an upper surface of said light-guide plate,

wherein said bottom cover is fixed to said case frame

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by fitting a projected latching portion provided on an end surface of said bottom cover, into a concave portion provided at a lower portion of an inner surface of said case frame.

15. (Amended) A area light source apparatus according to claim 14, wherein

said light source is arranged on the peripheral side-surface of said light-guide plate by fitting at least one pin formed on a side surface of said light-guide plate, into a hole formed on said light source corresponding to said pin.

16. (Amended) A area light source apparatus according to claim 14, wherein

said light-guide plate is fitted into said case frame and is fixed to said case frame by a hook, as a projected latching portion, having an engaged surface on a lower end, which is provided for said case frame or said light-guide plate.

17. (Amended) A area light source apparatus according to claim 14, wherein

said light source is arranged on the peripheral side-surface of said light-guide plate by fitting at least one pin formed on a side surface of said light-guide plate, into a hole formed on said light source corresponding to said pin, and

said light-guide plate is fitted into said case frame and is fixed to said case frame by a hook, as a projected latching portion, having an engaged surface on a lower end, which is provided for said case frame of said light-guide plate.

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18. (Amended) A area light source apparatus according to claim 10, wherein

said light-guide plate is fitted into said case frame and is fixed to said case frame by a hook, as a projected latching portion, having an engaged surface on a lower end, which is provided for said case frame or said light-guide plate.

19. (Amended) A area light source apparatus according to any one of claims 10 to 14 or 17, wherein a concave portion for accommodating said light source is provided for said case frame.

20. A area light source apparatus according to Claim 19, wherein said concave portion provided for said case frame comprises a spring for pressing said light source to said light-guide plate.

21. (Amended) A area light source apparatus according to claim 14, wherein

said light source is accommodated in a concave portion provided for said light-guide plate, and

said light-guide plate is fitted into said case frame and is fixed to said case frame by a hook, as a projected latching portion, having an engaged surface on a lower end, which is provided for said case frame or said light-guide plate while a spring provided for said case frame enables said light source to press said light-guide plate.



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22. A area light source apparatus comprising: a light-guide plate which is planar-shaped; at least one light source which is arranged on a peripheral side-surface of said light-guide plate; a case frame formed integrally with a bottom cover, for accommodating said light-guide plate and said light source; and a light scattering sheet which is arranged on an upper surface of said light-guide plate,

wherein said light source is accommodated in a concave portion provided for said light-guide plate, and

said light-guide plate is fitted into said case frame and is fixed to said case frame by a hook, as a projected latching portion, having an engaged surface on a lower end, which is provided for said case frame or said light-guide plate while a spring provided for said case frame enables said light source to press said light-guide plate.

23. A area light source apparatus according to Claim 21 or 22, wherein the inner surface of said case frame comprises the spring for pressing said light source to said light-guide plate.

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24. A area light source apparatus comprising: a light-guide plate which is planar-shaped; at least one light source which is arranged on a peripheral side-surface of said light-guide plate; a case frame formed integrally with a bottom cover, for accommodating said light-guide plate and said light source; and a light scattering sheet which is arranged on an upper surface of said light-guide plate,

wherein said light source is mounted on said case frame by fitting at least one pin formed on said case frame, into a hole formed on said light source corresponding to said pin, and

said light-guide plate is fitted into said case frame so that said light source is arranged on the peripheral side-surface of said light-guide plate.

25. A area light source apparatus according to Claim 24, wherein said light-guide plate is fixed to said case frame by a hook, as a projected latching portion, which has an engaged surface at a lower end and is provided for said case frame or said light-guide plate.

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26. (Amended) A area light source apparatus according to claim 14, wherein

said light source is mounted on said case frame by fitting at least one pin formed on said case frame, into a hole formed on said light source corresponding to said pin, and

said light-guide plate is fitted into said case frame so that light source is arranged on the peripheral side-surface of said light-guide plate.

27. A area light source apparatus according to Claim 26, wherein said light-guide plate is fixed to said case frame by a hook, as a projected latching portion, which has an engaged surface at a lower end and is provided for said case frame or said light-guide plate.

28. A area light source apparatus according to Claim 24 or 26, wherein said pin is formed at a concave portion formed to said case frame, and said light source is mounted on the concave portion of said case frame by fitting said pin into the hole formed on said light source corresponding to said pin.

29. A area light source apparatus according to Claim 24 or 26, wherein said case frame comprises a spring for pressing said light-guide plate to said light source.

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30. (Amended) A area light source apparatus according to any one of claims 10, 11, 14, 22, and 24 wherein said light scattering sheet is adhered to a lower surface of a reinforcing frame, said case frame has a notch corresponding to a portion for accommodating said reinforcing frame of said light scatter sheet at a part of an upper end surface, and said reinforcing frame is accommodated in said case frame by fitting a projected latching portion provided at an end surface of said reinforcing frame, into a concave portion provided on an inner surface of the notch in said case frame.

31. (Amended) A area light source apparatus according to any one of claims 10, 11, 14, 22, and 24 wherein said case frame has a notch corresponding to a portion for accommodating said light scattering sheet at a part of an upper end surface, and said light scattering sheet is accommodated in said case frame by fitting a projected latching portion provided on an end surface of said light scattering sheet, into a concave portion provided on an inner surface of the notch in said case frame.

32. (Amended) A area light source apparatus according to any one of claims 11, 16, 22, 25, and 27, wherein said hooks are formed on inner surfaces opposed to

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each other, on one side of said case frame, while mutually being separated, and are formed on both sides of a mounted position of said light source.

33. (Amended) A area light source apparatus according to any one of claims 11, 16, 22, 25, and 27, wherein said hooks are formed on opposed inner surfaces on one side of said case frame, point-symmetrically to the center of said case frame, and further are formed in the center in a width direction, of opposed inner surfaces on the other side of said case frame.

34. (Amended) A area light source apparatus according to any one of claims 11, 16, 22, 25, and 27, wherein said hooks are formed on opposed inner surfaces, on one side of said case frame, while mutually being separated.

35. (Amended) A area light source apparatus according to any one of claims 11, 16, 22, 25, and 27, wherein said hooks are formed at an uppermost portion of the inner surfaces of said case frame and a height of said light-guide plate is up to the engaged surface of said hook.

36. (Amended) A area light source apparatus according to any one of claims 11, 16, 22, 25, and 27, wherein said hooks are formed at an uppermost portion of the inner surfaces of said case frame, said light-guide plate is formed with a stepped surface for being engaged to the engaged surfaces of said hook in an ascending direction and, thus, the upper surface of said light-guide plate and an outer end surface of said case frame exist on the same plane.

37. (Amended) A area light source apparatus according to any one of claims 11, 16, 22, 25, and 27, wherein said hooks are formed at an intermediate portion in a height direction of the inner surface of said case frame, said light-guide plate is formed with a stepped surface for being engaged to the engaged surface of said hook in an ascending direction and, thus, the upper surface of said light-guide plate and an outer end surface of said case frame exist on the same plane.

38. (Amended) A area light source apparatus according to any one of claims 11, 16, 22, 25, and 27, wherein said hooks are formed at an intermediate portion in a height direction of said light-guide plate and a concave portion, into which said hook is

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fitted, is provided at an intermediate portion in a height direction of the inner surface of said case frame.

39. (Amended) An image reading apparatus using a area light source apparatus according to any one of claims 2, 4, 6, 10, 14, 22, 25, and 27, as an illumination light source of a transparent original.